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Strategic Nuclear Targeting

EDITED BY

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AND

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Cornell University Press

ITHACA AND LONDON

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Population Targeting and U.S. Strategic Doctrine

JEFFREY RICHELSON

INTRODUCTION

Among the alternative targeting options discussed in the Phase I report of the Carter administration's Nuclear Targeting Policy Review Panel was the option to Punish Soviet Society.¹ Specifically, this meant targeting Soviet population and industry, regardless of the role played in Soviet war-making activities.

While the primary results of the targeting review, as manifested in Presidential Directive 59 and reaffirmed by Reagan administration National Security Decision Directive-13, were an increased emphasis on military and political targeting and the requirement of a capability for conducting a prolonged nuclear exchange, urban-industrial targeting remains a possibility—at least as a 'final' option when war has escalated to spasm level. Thus in his Fiscal Year 1979 posture statement Secretary of Defense Harold Brown maintained that the United States needed to retain the capability and option of destroying the two hundred major Soviet cities.² And in 1981 two strategic analysts considered the capability of cruise missiles to inflict certain levels of fatalities on the Soviet population.³

Aside from the threat of urban-industrial destruction resulting from direct targeting, the threat of the inevitable significant levels of collateral damage resulting from the large-scale use of nuclear weapons—even in a purely counterforce attack—still plays an important role in strategic thinking. The concern exhibited about possible Soviet ability via civil defense programs to sharply curtail fatalities and even industrial destruction highlights the significance of this factor in the strategic calculus. Indeed, it would not be facetious to suggest that present strategic plan-

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INTRODUCTION

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This chapter focuses on the past and present role of population targeting in U.S. strategic planning. As used here the term *population targeting* refers to the targeting of population per se—in which case targeting of population away from urban areas, that is, in evacuation and relocation areas, may occur—as well as to the targeting of urban-industrial areas. In the latter case individual targets may consist of economic installations but be so numerous and widely distributed as to be equivalent to anticity attacks. Prior to the discussion of targeting in the early nuclear era it is appropriate to consider the prenuclear heritage of population targeting.

PRENUCLEAR HERITAGE

Urban-industrial targeting on a mass scale was one of the “innovations” of World War II. Two factors that combined to produce this innovation were the theoretical discussions of the utility of such bombing in the period between the world wars as well as the technical limitations that foreclosed more discriminate targeting options.

The major theoreticians of population or urban-industrial targeting were Italian brigadier Giulio Douhet and British air marshal Trenchard. Douhet argued that urban-industrial bombing was inevitable. Previously a nation could “shield itself behind the stout armor of an army and navy.”⁴ It was inevitable, however, that

The air arm . . . will strike against entities less well-organized and disciplined than the army and the navy, less able to resist and helpless to act and counteract. It is fated, therefore, that the moral and material collapse will come about more quickly and easily. A body of troops will stand fast under intensive bombings even after losing half or two-thirds of its men; but the workers in shop, factory, or harbor will melt away after the first losses.⁵

A similar vision was expressed by Trenchard, who felt that the object of war was to defeat the “enemy nation,” not merely its army, navy, or air force. Further, according to Trenchard, it was easier to affect the morale of a nation by air attack than the morale of an army in the field. Thus the civilian population constituted the

points at which the enemy is weakest. The rifleman or the sailor is protected, armed and disciplined, and will stand under fire. The great centres of manufacture, transport and communications cannot be wholly protected. The

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personnel again, who man them are not armed and cannot shoot back. They are not disciplined and it cannot be expected of them that they will stick solidly to their lathes and benches under the recurring threat of air bombardment.⁶

Further, he argues that

"The effect on the workers of a nation of an intensive air campaign will again be infinitely greater than if the main part of the air attack was launched at the enemy's airdrome and airplanes which may be many miles from vital points."

i.e. fight "diversion" of attack to these

Thus, according to Quester, Trenchard would have passed up a "no-cities" targeting policy if it had been offered, "believing that the quick way to disarm the enemy's military forces was not to strike at air bases but at the civilian sector that supported the bases."⁸ To Trenchard, destruction of morale and economic capabilities were intimately linked to success.

Despite this intellectual support for urban-industrial targeting, World War II initially involved no such strategy. Thus British expectations of an immediate "knockout blow" attempt by the Luftwaffe in the opening rounds of World War II saw no bombing raids at all on the populated areas of Britain and France. Nor were such attacks directed against Germany.

Thus by 15 May 1940 a program of "precision" night bombings of military and industrial targets in Germany had already begun.⁹ Such attempts at precision bombing presented Britain with a dilemma, however. The limitations of British technology precluded nighttime precision bombing. At the same time, the effectiveness of German defenses during daylight made daytime attacks too hazardous. Hence night bombing as a means of reducing losses of aircraft and personnel required an acceptance of severely reduced accuracy.

According to the official British history of British intelligence operations in World War II, "it was on account of these [the previously mentioned] difficulties, as much as under the influence of the general arguments for strategic bombing, that Bomber Command, which had abandoned day bombing as early as April 1940, embarked on the transition from precision to area bombing in October 1940, from which date it had concentrated its night bombing against single towns or industrial areas instead of against specific industrial installations."¹⁰

This early emphasis on area bombing was not shared and sustained to the same degree by the United States. At the end of the war the United States was primarily concerned with precision bombing of communications and oil transport targets.¹¹ At the same time the United

States was also engaged in Asian theaters. Thus the raid on Dresden on 13 February 1945 killed 135,000 people.¹² In Japan, the city of Tokyo was bombed on 9 March 1945, the city and killing over 100,000 people by fire.¹³ Because the bombing was continued—with the

The morality of such actions during the war. Arguments against the morality of just war and proportionality were forbidden and the military action were justified. Thus Grenville, drifting into a war in Vietnam (or at least inevitably on a great scale).¹⁴

Others argued that the "saved" more lives than the atomic bombing of Hiroshima and Nagasaki. The U.S. (and Japanese) "inevitable" U.S. invasion killed by the use of the

POPULATION TARGETING

The same factors that influenced targeting in World War II—the theoretical and the technological—were also present in the nuclear age.

The technological limitations of the extremely small atomic bomb range and other limitations of the nuclear component. In 1947 there were only a few atomic bombs by the commander of the Strategic Air Force. He concluded that given the "is primarily an offense against industrial targets."¹⁸ The "super" or H-bomb power of such a weapon in a discriminating fashion.

States was also engaged in area bombing in both the European and Asian theaters. Thus the United States participated with Britain in a joint raid on Dresden on 13-15 February 1945 which killed approximately 135,000 people.¹² In Japan, the United States launched an attack on Tokyo on 9 March 1945 with 334 B-29s, dropping incendiary bombs on the city and killing over 83,000 people while leveling a large portion of the city by fire.¹³ Because this raid was rated a success, the area offensive was continued—with the objective of leaving no Japanese city standing.

The morality of such attacks was questioned both during and after the war. Arguments against their morality focused on Catholic principles of just war and proportionality—that the deliberate killing of innocents was forbidden and that their deaths as the “unintended” result of military action were justified only if that action saved more lives that it took. Thus Grenville Clark noted the “great moral issue involved in drifting into a war in which the premeditated plan of campaign calls for (or at least inevitably involves) the destruction of non-combatants on a great scale.”¹⁴

Others argued that such attacks could be justified as long as they “saved” more lives than were lost. Thus the atomic bombings of Hiroshima and Nagasaki have been justified on the grounds that the levels of U.S. (and Japanese) casualties which would have resulted from the “inevitable” U.S. invasion of the mainland far exceeded the numbers killed by the use of the atomic bomb.¹⁵

“WAS US INVASION (Alternative)
NECESSARY OR INEVITABLE?”

POPULATION TARGETING AND U.S. NUCLEAR WAR PLANS, 1946-1982

The same factors that contributed to the emphasis on urban-industrial targeting in World War II continued to be factors in the early nuclear era—the theoretical utility of destroying enemy urban-industrial areas, and the technological limitations.

The technological limitations were of several varieties, including the extremely small atomic weapons stockpile as well as the delivery aircraft range and other limitations.¹⁶ As of 30 June 1946 there were available the nuclear components for only nine implosion weapons. As of 30 June 1947 there were only thirteen.¹⁷ Thus a top-level committee, appointed by the commander of the army air forces in the fall of 1945, later concluded that given the expense and limited availability of the A-bomb it “is primarily an offensive weapon for use against very large urban and industrial targets.”¹⁸ This view was reinforced by the development of the “super” or H-bomb; it was felt by strategists that the destructive power of such a weapon eliminated any possibility of its being employed in a discriminating fashion.¹⁹

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Additionally, U.S. intelligence capabilities were in no way adequate, prior to the advent of aircraft (e.g., U-2) or satellite (e.g., SAMOS, Corona) reconnaissance capabilities to determine the location of the full spectrum of Soviet military assets.²⁰ On the other hand, cities were easy to find and destroy.

The theoretical arguments in favor of population/urban-industrial targeting were also similar to World War II arguments concerning the destruction of enemy war-making capability and morale. Thus the authors of the DROPSHOT requirements study (written in 1949) stated: "It may become advisable to abandon the concept of destruction of the enemy's physical means to wage war in the favor of a concept involving the destruction of his will through selective attack of limited complexes or mass attack of people."²¹

Thus a late 1945 target list specified 20 Soviet cities, including Moscow and Leningrad, that would be bombed in the event of war. A 1946 revision called for hitting 17 of the 20 cities with a total of 98 atomic bombs, with another 98 being held in reserve.²² The anticipated effects of such attacks were discussed in a 1947 memorandum:

it seems reasonable to anticipate that the use of this weapon would create a condition of chaos and extreme confusion. Not the least of this effect would be an increased element of hopelessness and shock resulting from the magnitude of destruction; the fear of the unknown; the actual lingering physical after effect of atomic explosions; the psychological effect arising from the necessity to evacuate large densely populated areas; and the attendant psychological state which these factors will create.²³

TEAROR

The 1948 war plan, FLEETWOOD, called for the use of 133 bombs in a single massive attack against 70 Soviet cities. Eight were to be targeted on Moscow and meant to destroy forty square miles of that city while 7 bombs would be allocated to destroy Leningrad.²⁴ If the war lasted as long as two years, approximately 200 more atomic bombs would be directed against Russia, obliterating as much as 40 percent of Soviet industry and 7 million people. Thus at the end of 1948 the SAC emergency war plan stated that the "highest priority target system is that system constituted by the major Soviet urban-industrial concentrations."²⁵ *not mil.*

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A subsequent plan, TROJAN, provided for a total of 300 atomic bombs to be dropped on Russia and included the all-out bombing of Soviet cities and industry. The atomic air offensive would kill between 3 and 5 million Russians and leave up to 28 million homeless.²⁶

In examining these early war plans, we should keep two important qualifications in mind. First, the concentration of population urban-in-

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Industrial targeting was partially the result of perceived technological-economic limitations and partially the result of the perception that given these limitations the most effective way of blunting a Soviet attack was the destruction of war-making capacity via the destruction of factories and workers. Second, while there was a significant allocation of bombs to urban-industrial targets, there was also a substantial allocation of bombs to other targets. These other targets included military forces, stockpiles, bases, political and administrative centers and Soviet nuclear forces. Thus the DROPSHOT study, drawn up in 1949 which assumed a war beginning in 1957, included the following target sets: (1) stockpiles of weapons of mass destruction as well as the facilities for their production and means of delivery; (2) key governmental and control centers; (3) lines of communication, military supply lines, troop concentration, and naval targets; and (4) important elements of Soviet and Soviet-satellite industrial economy. JSOP 2

The plan required that about three hundred atomic bombs and twenty thousand tons of high-explosive conventional bombs be dropped on about seven hundred targets located in approximately one hundred urban areas.²⁷

DROPSHOT reflected the findings of the Harmon Committee, set up in mid-1949 by Secretary of Defense James Forrestal to evaluate the impact of an atomic air offensive against the Soviet Union. The group estimated that the attack on seventy cities called for in FLEETWOOD would produce a 30 to 40 percent reduction in Soviet industrial capacity and as many as 2.7 million fatalities and 4 million casualties. However, the report also concluded that industrial losses would not be permanent and could be either alleviated by Soviet recuperative action or augmented, depending on the weighted effectiveness of follow-up attacks. More important, the capability of Soviet armed forces to advance rapidly into selected areas of Western Europe and the Middle East and Far East would not necessarily be impaired. The committee also concluded that planned air attacks would not "destroy the roots of Communism or critically weaken the power of the Soviet leadership to dominate the people."²⁸

Hence DROPSHOT gave substantial attention to targets other than population and industry—although many of the military and political targets were located in or near urban areas. This, combined with a continuation of population/urban-industrial targeting, produced the large number of weapons targeted on urban areas. This state of affairs continued throughout the Eisenhower administration, when the first integrated war plan, the SIOP (Single Integrated Operational Plan), was drawn up. The first SIOP called for attacks on all major Soviet and other Communist cities in the event of war.²⁹ In some cases ten bombs were targeted on

a city.³⁰ No alternative options were available, and no forces were to be held in reserve. In the event of war, 360 to 525 million casualties were predicted.³¹

DE The SIOP was inherited by the Kennedy administration, one of whose early major tasks was the SIOP's revision. As a result of the revision a spectrum of attacks became possible—only one of which included direct attacks on cities—and the concept of population avoidance was introduced into strategic war planning. The spectrum of potential attacks progressed from attacks on Soviet strategic forces, Soviet air defense away from cities, Soviet air defense near cities, and Soviet command and control centers, only finally moving to spasm attacks on cities.³²

? ✓ This shift in war planning was first made public in a speech by Defense Secretary Robert McNamara on 17 February 1962. It is his now-famous commencement address at the University of Michigan, however, which best spelled out the logic of the change in strategy. Thus McNamara stated:

The U.S. has come to the conclusion that to the extent feasible, basic military strategy in a general nuclear war should be approached in much the same way that the more conventional military operations have been regarded in the past. That is to say, principal military objectives, in the event of a nuclear war stemming from a major attack on the Alliance, should be the destruction of the enemy's military force, not of his civilian population.³³

A variety of factors compelled McNamara to backtrack, quickly and publicly, from his statement. These factors included hostile reactions from both European allies and the Soviet Union and, most important, use of the statement by the air force to justify large increases in funding for strategic forces.

Thus McNamara made U.S. ability to destroy specific percentages of Soviet population and industry in a retaliatory strike (the Assured Destruction capability) the cornerstone of United States declaratory policy. Thus, in his 1965 Posture Statement, McNamara spoke of the U.S. need to be able to destroy 25 to 33 percent of Soviet population and 67 percent of Soviet industry to ensure deterrence.³⁴

Despite this public emphasis on urban-industrial targeting, U.S. employment policy, as evidenced in the SIOP itself, remained the same, with attacks on Soviet cities being considered a last resort. Thus, as a result of various pressures, McNamara in public talked of only the nuclear capability and strategy required for the last phases of an all-out nuclear conflict—"the sufficient reserve striking power to destroy an enemy society if driven to it" that he mentioned in his Ann Arbor address—and eschewed further discussion of counterforce targeting.

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This state of affairs remained constant throughout the Kennedy, Johnson, and Nixon administrations. Thus an assistant secretary of defense in the last years of the Johnson administration has written:

The SIOP remains essentially unchanged since then [McNamara's Ann Arbor speech of 16 June 1962]. There have been two developments, however: (1) it has become more difficult to execute the pure-counterforce option, and its value is considered to be diminishing and, (2) all public officials have learned to talk in public only about deterrence and city attacks, no war-fighting, no city-sparing. Too many critics can make too much trouble... so public officials have run for cover.³⁵

It was during the Nixon administration, however, that consideration was given to further revisions in the SIOP and in public declaratory policy. Soon after taking office in January 1969, the Nixon administration began a series of studies concerning nuclear targeting options. These studies led, eventually, to National Security Study Memorandum (NSSM) 169, approved by President Richard Nixon in late 1973, and in turn to National Security Decision Memorandum (NSDM) 242, signed by the president in January 1974.³⁶

On the basis of NSDM-242 the first significantly limited nuclear options were developed and announced. At the same time NSDM-242 implementing documents specified that in the event of an SIOP-level attack, the primary objective of U.S. strategic forces was to delay for as long as possible the Soviet Union's recovery as a major economic and military power. This was to be accomplished by destruction of 70 percent of the Soviet economic recovery base.³⁷ Population per se was not to be targeted. This change in targeting policy was first announced by Secretary of Defense Elliot Richardson, who testified in April 1973: "We do not in our strategic planning target civilian population per se."³⁸ Care is now taken in developing the SIOP to select Desired Ground Zeros (DGZs) for SIOP targets so that their planned destruction is optimized in terms of this policy constraint.³⁹

It is clear, however, that even if population destruction is not an objective of strategic targeting, even at the SIOP level, given the collocation of population and industry (discussed in more detail below) any attack designed to cripple the Soviet economic recovery base would produce massive civilian casualties. Thus U.S. officials have acknowledged that "strategic nuclear warfare would not be so neat that you would only get the factories" and that "we are not targeting people here but we are indeed causing many, many casualties."⁴⁰

Indeed, the casualties resulting from such attacks may be considered desirable. The desirability may be based on the perception of certain subgroups of the population (e.g., workers) as economic assets to be

destroyed as a means of hindering economic recovery. Thus, during the Vietnam war, it was the policy not to bomb the population per se, but workers were regarded as an economic resource and hence exempted from this injunction.⁴³ This view has been endorsed in the nuclear context: "A number of studies done in the U.S. have examined the factors influencing industrial recovery of a nation following a nuclear attack. Taken collectively, the results indicate that survival of the work force is by far the most important factor in industrial recovery."⁴²

Further, the overall threat of population fatalities in enhancing deterrence has been cited by U.S. officials in discussions of U.S. strategic programs. Thus one official, in testifying before the Senate Armed Services Committee, said, "I think you have to understand we have several levels of a requirement to have assured destruction to a population base and then you have the overall general SIOP plan, and I think one of the things we would have at a minimum constraint is that we would always be able to deliver some reasonable number which would be a threat to the population base."⁴³ And John Walsh, when deputy director of Defense Research and Engineering, was reported by the *Los Angeles Times* as stating that "an important factor in deterrence is the Soviet comprehension of what may be involved. . . . We do target industrial sites which are co-located with population centers"; he went on to explain that civilian casualties were a factor in potential damage assessments.⁴⁴ Finally, as mentioned by Desmond Ball, Secretary of Energy James Edwards indicated that the yields required for U.S. nuclear weapons systems were partially a function of Soviet civil defense capabilities.⁴⁵

Upon entering office, the Carter administration launched the National Targeting Policy Review (NTPR) with PD-18, titled *U.S. National Strategy*, and continued NSDM-242 in force until further notification. As a result of the review, PD-59 was issued, which shifted emphasis from economic recovery targeting to political leadership and military assets (both strategic and conventional) targeting.⁴⁶ The target set included 700 underground shelters throughout the country for key Soviet officials, 2,000 strategic targets (including 1,400 ICBM silos and 600 C² bunkers, nuclear storage sites, and strategic air and naval facilities), 3,000 other military targets (500 airfields, plus military units, supply depots, and critical transportation links), plus 200 to 400 key factories.⁴⁷ Again, population per se was not to be targeted in the initial stages of the war. However, the capacity for such targeting in the event of a Soviet attack on U.S. urban-industrial areas was specified. Thus, in the secretary of defense's annual report for Fiscal Year 1979, Harold Brown wrote: "It is essential that we retain the capability at all times to inflict an unacceptable level of damage on the Soviet Union, including destruction of a minimum of 200 major cities."⁴⁸

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This continued importance of an urban-industrial destruction capability was evidenced in the following exchange between Gen. Kelley Burke, air force deputy chief of staff for Research, Development, Test, and Evaluation, and Congressman Norman Dicks:

MR. DICKS:

You haven't taken away any weapons aimed at the urban industrial base of the Soviet Union, have you, but you've added weapons to the military targets? Is that a fair way of putting it?

GENERAL
BURKE:

Yes.⁴⁹

Continued U.S. interest in the capability to destroy a significant portion of the Soviet populace, "if necessary" was evidenced in several recent government or government-funded studies. Thus the Department of Defense's 1977 "Alternative U.S. Civil Defense Programs," ACDA's 1978 "Civil Defense Study," and the 1978 PRM-32 paper, the "Strategic Usefulness of Civil Defense—Attack Related Effectiveness" all considered the effects of civil defense on Soviet population fatalities.

A 1978 study by Scientific Applications, Inc., conducted as part of the Nuclear Targeting Policy Review, indicated continued U.S. interest in the possibility of population targeting. The study, titled *The Feasibility of Population Targeting*, addressed the question of whether—given projected U.S. force characteristics and alternative Soviet civil defense postures—the United States would be able to inflict a specified level of fatalities.⁵⁰ The study considered alternative combinations of urban sheltering and evacuation to host areas and allowed for U.S. targeting of host areas to kill relocated population. Thus population fatalities were not only sought in targeting urban areas but also were to be sought by attacking relocation sites.

Hence, although the United States has adopted a policy of not targeting population per se at all and not targeting urban-industrial areas in the initial stages of a nuclear conflict, there is still concern over U.S. capability to inflict civilian casualties indirectly, "if necessary," and U.S. expectation that the projected urban-industrial/population destruction resulting from a large-scale use of nuclear weapons is useful in enhancing deterrence.

RATIONALE FOR POPULATION AVOIDANCE

There are several reasons why a nation may adopt a population-avoidance strategy in one form or another. Population targeting is clearly

True
immoral—there is no philosophical justification for deliberate attempts to kill or terrorize noncombatants. If there is any significant debate concerning morality and population targeting it revolves around whether even the threat of such targeting can be morally justified.⁵¹ However, nations have not been notably influenced in the past, especially in wartime, by philosophical considerations of morality. Nor do the populations of countries at war seem to be particularly concerned that their armed forces observe restrictions in attacking enemy nations.

by whom?
On the other hand, nations, especially in peacetime, want at least to give the appearance of conforming to international law. During the reviews of U.S. targeting policy and plans which took place in the early 1970s, both State Department and other officials pointed out that the targeting of population contravened a number of international laws to which the United States was a signatory. It was decided that the national guidance in 1974 should make explicit mention of the fact that population per se was not targeted.⁵²

The U.S. legal obligation was further strengthened by U.S. ratification of the 1977 Protocol I to the 1949 Geneva Convention. Article 85 of the 1977 Protocol I prohibits "making the civilian population or individual civilians the object of attack."⁵³ Such a prohibited attack would include one that

- (a) treats as a single military objective a number of clearly separated and distinct military objectives located in a city, town, village or other area containing a similar concentration of civilians or civilian objects;
- (b) ... may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated; and
- (c) [are] attacks against the civilian population or civilians by way of reprisals.⁵⁴

cost risk
A practical consideration in decisions to pursue population-avoidance strategies, at least in the initial phase of a war, is credibility. Thus it is argued that a U.S. threat to destroy Soviet cities in response to Soviet attacks away from U.S. cities (on U.S. ICBMs, for example) is not a credible one since such an attack would result in direct Soviet retaliation against U.S. cities. Likewise, U.S. threats to attack Soviet cities in response to a Soviet attack on Western Europe would, according to this logic, be even less credible.

Additionally, and perhaps most important, pursuing a population-avoidance strategy would give the Soviet Union an incentive to refrain from attacks on U.S. cities and create an obvious set of "bargaining chips" in pursuing escalation control/intrawar deterrence and war termination objectives.

That there is a population avoidance strategy of some way to achieve it—rather than simply trying to question is technical strategy that when urban damage attempt to kill population both morally and strategy a policy of not targeting leadership can distribute industrial attacks in urban-industrial area

Hence it is impossible to meaningfully reduce urban damage. It is argued that urban damage is inevitable in a war with weapons characterized by massive losses are inevitable

An SIOP-level attack on political assets as well as reduce civilian casualties. A theoretical footnote reported that "a U.S. attack on the SIOP—but avoid killing 70–90% of major Soviet cities and 50% of other military

Nor is it likely that a strategy compatible with a population avoidance strategy were to consider a population avoidance strategy is doubtful, given Table 11.1, that large

Even assuming that all nuclear installations a significant number of nuclear weapons would be expected to be destroyed or killed by effects or killed by nuclear weapons. With the reentry of the Trident, the destruction of a 100 kt weapon

FEASIBILITY OF POPULATION AVOIDANCE

That there is a rationale (or rationales) for pursuing a population-avoidance strategy does not necessarily imply that there is a meaningful way to achieve it—even if the objective is to sharply limit casualties rather than simply to appear to conform with international law. A crucial question is technical feasibility. Unless a nation is able to develop a strategy that when carried out produces significantly less population/urban damage than would be incurred as a result of a deliberate attempt to kill population, the nation's strategy will be meaningless, both morally and strategically, whether or not it has formally adopted a policy of not targeting population *per se*.⁵⁵ Certainly, unless the Soviet leadership can distinguish population-avoidance attacks from urban-industrial attacks in terms of effects, their response will include U.S. urban-industrial areas.

Hence it is important to consider whether it is realistically possible to meaningfully reduce fatalities given present strategic policies. Some have argued that urban-industrial targeting and the mutual hostage relationship is inevitable in the nuclear era—that the location of targeting and weapons characteristics and effects are such that massive population losses are inevitable regardless of targeting strategy.⁵⁶

An SIOP-level attack that involved targeting of Soviet military and political assets as well as major manufacturing installations would produce civilian casualties at a level that would make population-avoidance a theoretical footnote. Thus the Office of Technology Assessment has reported that “a U.S. attack that struck the full set of Soviet targets in the SIOP—but avoided population *per se*—would still kill from 50–100 million people and injure perhaps 30 million others, while destroying 70–90% of major Soviet military and political leadership facilities, 20–50% of other military targets, 70–90% of Soviet manufacturing capacity.”⁵⁷

Nor is it likely that attacks on even one specific target set would be compatible with a serious reduction in civilian casualties. Thus, if one were to consider a large-scale attack on Soviet industrial installations, it is doubtful, given the collocation of population with industry shown in Table 11.1, that large-scale civilian casualties could be avoided.⁵⁸

Even assuming the use of 40-kt *Poseidon* warheads to attack industrial installations a significant fraction of the 80 million Soviets within 1.5 NM would be expected to be either killed directly from blast or thermal effects or killed by the destruction of buildings and other exposed objects. With the replacement of the 40-kt C-3 *Poseidon* by the 100-kt C-4 *Trident*, the destructive radius will expand further—the 10 psi radius for a 100 kt weapon being approximately 1.0 NM.

Issues in Strategic Nuclear Targeting

Table 11.1. Collocation of Soviet population with industry

Within (nautical miles)	Urban (millions)	Rural (millions)	Total (millions)
1.0	40	1	41
1.5	78	2	80
2.5	106	6	112
5.0	113	18	131

Source: U.S. Arms Control and Disarmament Agency, *ACDA Civil Defense Study Report Number 1*, 16 November 1977, p. 11.

Obviously, civil defense programs would reduce fatalities to some degree. Shelters at key economic installations could accommodate about 12–24% of the total Soviet work force. In a crisis, non-essential and off-duty workers would be evacuated. If one-half of the work force is dispersed, from 24 to 48 percent of the remainder could be sheltered. A minimum of 10 to 20 percent of the urban population (including essential workers) could be accommodated at present in blast-resistant shelters. By 1985, the percentage of urban population that could be sheltered would rise to 15 to 30 percent, assuming no change in the 1978 rate of shelter construction.⁵⁹

However, short of large-scale evacuation there is apparently little that can be done to sharply reduce Soviet civilian casualties. Thus, the CIA concluded that “the critical decision to be made by the Soviet leaders in terms of sparing the population would be whether or not to evacuate cities. Only by evacuating the bulk of the urban population could they hope to achieve a marked decrease in the number of urban casualties.”⁶⁰ Of course, this assumes that an evacuation decision could be effectively implemented.

One possible means of achieving significant damage to Soviet industry without massive civilian casualties would be an attack based on the concentration of Soviet industry. Soviet industries produce more than half their products in less than two hundred plants. These facilities produce primary metals, chemicals, petroleum construction equipment, agricultural equipment, railroad equipment, synthetic rubber, and electric power generation. There are only 8 copper refineries, 16 heavy-machinery plants, 34 sizable petroleum refineries, 18 integrated iron and steel mills, and 15 agricultural machine products plants. Nine tractor plants make 80 percent of the Soviet Union’s entire tractor output. Chemicals are largely produced in 25 cities. The entire central and Volga regions, with a total population of 60 million, gets their electricity from three hydroelectric plants and nuclear plants located near cities.⁶¹

However, aside from the problems with the econometric and input-

output models used of such targeting, would produce ma of such targets wit

Nor could one re to prevent large-sc capabilities. Such a Mt Minuteman IIs, cruise missiles and

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ACDA Civil Defense Study Report

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output models used to determine the ripple effect on the Soviet economy of such targeting, it is likely that attacks on the above targets alone would produce massive civilian casualties, given the likely collocation of such targets with population.

Nor could one reasonably expect an attack on strictly military targets to prevent large-scale casualties—given present warhead numbers and capabilities. Such an attack would involve, in addition to SLBMs, the 1-Mt Minuteman IIs, the 335-kt Minuteman IIIs, the 170-kt air-launched cruise missiles and, in the future, the 500-kt MX warheads.

Whether the targets were primarily strategic nuclear targets, especially ICBM silos, or power projection/other military targets would make little difference. Thus Ball has noted that "a U.S. retaliatory strike against Soviet ICBM fields, on the other hand, must cover nearly the entire geographic expanse of the Soviet Union, including the more heavily populated and industrial areas west of the Urals."⁶² Such an attack would involve two thousand to three thousand warheads, depending on damage requirements and the specific warheads used.

An attack on other military targets would require in the neighborhood of three thousand warheads. Most of these warheads would be directed against targets in western Russia—both because the preponderance of such targets is located there and because the targets' destruction is necessitated by a strategy designed to halt a Soviet advance into Europe.

If large-scale political targeting is involved, large-scale fatalities can be expected to result, inasmuch as attacking the Soviet political control structure would involve attacking the urban areas where it is located. Thus the headquarters of the Communist party, whether at the national or republic level, are located in major urban areas, as are the administrative centers of the forty-seven economic-administrative regions (*Sov-narkhoz*). Likewise, the headquarters of the sixteen Soviet military districts are located in major Soviet cities—including Moscow, Leningrad, Minsk, and Kiev.⁶³

Similarly, attacks on the KGB, MVD, or army troops used to maintain order would require attacking the cities either where they are permanently located or where they would move in the event war seemed a serious possibility. Massive casualties could be expected to result.

Even a political targeting policy directed solely at the seven hundred leadership bunkers would be problematical in producing negligible civilian casualties. Such bunkers would probably be located fairly close to the major cities in which the leadership resides. Further, it is likely that the higher-yield weapons in the U.S. arsenal would be employed to attack the bunkers so as to counteract their underground location and hardening. Together, these factors could mean significant collateral damage to the surrounding city areas.

Hence it seems unlikely that, at present, population avoidance is likely to be meaningful given the location of targets, the number of weapons that can be expected to be employed, and the characteristics of those weapons systems.

CONCLUDING REMARKS

Despite the pessimism expressed above concerning the present feasibility of meaningful population-avoidance strategies, it should not be taken as an endorsement of a Mutual Assured Destruction posture. The pessimism is an indication that statements by U.S. officials to the effect that "we do not in our strategic planning target civilian population *per se*" can be taken only as a statement of targeting mechanics rather than as a meaningful description of the effects (relative or absolute) of such a strategy.

Such a state of affairs implies that present distinctions between alternative targeting policies are of little consequence with regard to the damage to Soviet society. As Bernard Brodie has remarked: "It is useless to talk about strategies being counterforce strategies, as distinct from counter-economy or counter-population strategies, *unless* planners were actually to take deliberate restrictive measures to refrain from injuring cities. . . . Otherwise it can hardly mean much to the population involved whether the destruction of cities is a by-product of the destruction of airfields or vice versa."⁶⁴ *How do plans differ from "counter-pop"?*

And, in fact, Department of Defense Instruction 5500.15, dated 16 October 1974, requires that all Defense Department actions concerning the acquisition and procurement of weapons and their planned use in war be consistent with all U.S. international obligations, including obedience to the laws of war.⁶⁵ According to Carl Builder and Morlie Graubard of the Rand Corporation, the instruction further obligates "any reasonable improvements that might enhance the conformance of such weapons to the law of armed conflict"—including avoidance of unnecessary injury to civilians and their property.⁶⁶

Some might argue that there is nothing planners *can* do short of disarmament to avoid massive population/urban-industrial damage. However, the suspicion that such an effort might prove fruitless is no reason not to attempt it—especially since such an effort could be compatible with serious arms reductions. It would seem to be a minimum moral requirement of the possession of nuclear weapons to seek to reduce to as great an extent as possible the loss to civilian lives and property which would result from the use of such weapons.

Such an effort would involve identifying military, political, and war-

supporting industrial targets whose destruction with very-low-yield (significantly less than the 40-kt Poseidon warheads) high-accuracy warheads would produce significantly fewer casualties. In such an effort the objective would be to determine a target list whose destruction with appropriate low-yield weapons would severely limit damage to the Soviet population yet severely damage the Soviet military-political position. Obviously, in addition to developing the target list, present U.S. strategic weapons systems would have to be replaced by more appropriate systems.

The feasibility and/or wisdom of such a program might be questioned on several grounds. First, as noted above, it might be argued that such a program is impossible to achieve—that the targets whose prospective destruction are necessary to deter the Soviet leadership cannot be destroyed without significant civilian casualties—due to the targets' location and/or the weapons necessary to destroy those targets. Such a view generally assumes the weapons and their characteristics to be similar to present systems. However, if the weapons systems are variables, as envisaged above, the possibility of limiting damage exists.

Second, it might be argued that such a program will give the impression that a "bloodless" nuclear war can be fought, thus increasing the probability of war. Such an objection implies acceptance of the view that decisions to go to war are largely based on calculations concerning the expected results of a nuclear exchange. A more realistic view would stress the relative (and indeed, absolute) lack of influence of the "state of the strategic balance" on such decisions when compared with the nature of a particular political/strategic conflict. The decision to go to (or seriously risk) war is far more dependent on the threat perceived to a "vital" national interest than to targeting policies or arsenal capabilities.

Finally, it should be noted that such a program may provide impetus for arms control and restraint. Clearly, weapons such as the 500-kt MX or 335-kt version of the Trident D-5 are not appropriate for limiting collateral damage. Hence it can be argued that Department of Defense development and procurement plans for these weapons is in violation of Instruction 5500.15.

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